EXHIBIT G

California State Lands Commission Presurvey Notice Requirements for Permittees to Conduct Geophysical Survey Activities

All parts of the Presurvey Notice must be adequately filled out and submitted to the CSLC staff a minimum of twenty-one (21) calendar days prior to the proposed survey date to ensure adequate review and approval time for CSLC staff. Note that one or more of the items may require the Permittee to plan well in advance in order to obtain the necessary documentation prior to the Notice due date (e.g., permits from other State or Federal entities). Please use the boxes below to verify that all the required documents are included in the Presurvey Notice. If "No" is checked for any item, please provide an explanation in the space provided. If additional space is needed, please attach separate pages.

Please use the boxes below to verify that all the required documents are included in the Presurvey Notice. If "No" is checked for any item, please provide an explanation in the space provided. If additional space is needed, please attach separate pages.

Yes	No	
X	☐	Geophysical Survey Permit Exhibit F
X	☐	Survey Location (including a full-sized navigation chart and GPS coordinates for each proposed track line and turning point) Explanation:_____
	X	Permit(s) or Authorization from other Federal or State agencies (if applicable) Explanation: _____
X	☐	21-Day Written Notice of Survey Operations to Statewide Geophysical Coordinator/
X	☐	U.S. Coast Guard Local Notice to Mariners/
X	☐	Harbormaster and Dive Shop Notifications Explanation:_____
X	☐	Marine Wildlife Contingency Plan Explanation:_____
X	☐	Oil Spill Contingency Plan Explanation:_____
X	☐	Verification of California Air Resources Board's Tier 2-Certified Engine Requirement Explanation:_____
X	☐	Verification of Equipment Service and/or Maintenance (must verify sound output) Explanation:_____
☐	X	Permit(s) or Authorization from California Department of Fish and Wildlife for surveys in or affecting Marine Protected Area(s) (if applicable). Explanation: *Survey area is not within nearby Channel Islands MPA*

._____

NOTE: CSLC staff will also require verification that current biological information was obtained and transmitted as outlined in Section 5 of this permit

EXHIBIT F

PRESURVEY NOTIFICATION FORM

Applicant/Permittee's Mailing Address:
Tim Elfers
USGS
Pacific Coastal and Marine Geology
2885 Mission Street
Santa Cruz, CA 95060

Date: 6/12/18
Jurisdiction: Federal ____State __X_Both ___

If State: Permit #PRC 8394
Region: II
Area: Santa Barbara, CA

GEOPHYSICAL SURVEY PERMIT

Check one: __X__ New survey ____Time extension of a previous survey

U.S.G.S. Pacific Coastal and Marine Geology (Applicant/Permittee) will conduct a geophysical survey offshore California in the survey area outlined on the accompanying navigation chart segment. If you foresee potential interference with commercial fishing or other activities, please contact the person(s) listed below:

FEDERAL WATERS (outside 3 nautical miles)

1) Applicant's representative: Tim Elfers
2) Federal representative: U. S. Geological Survey

NOTE: Any comments regarding potential conflicts in Federal waters must be received by the Applicant's Representative and lead Federal agency within ten (10) days of the receipt of this notice.

STATE WATERS (Inside 3 nautical miles)

1) Permittee's representative: Tim Elfers
2) CSLC representative: Richard Greenwood

NOTE: Any comments regarding potential conflicts in State waters should be received as soon as possible by the Permittee's representative, no more than fifteen (15) days after the receipt of this notice.

1. Expected Dates of Operation: July 9 – 17, 2018.
2. Hours of Operation: 6AM to 7PM (daylight hours only)
3. Vessel Names: R/V Parke Snavely
4. Vessel Official Number: A1957E616, A0342A616
5. Vessel Radio Call Sign: WZ3374
6. Vessel Captain's Name: Dan Powers
7. Vessel will monitor Radio Channel(s): 13.16
8. Vessel Navigation System: Differential GPS
9. Equipment to be used:

Edgetech 512s1 Chirp Sub bottom Profiler

a. Frequency (Hz, kHz): 0.5-12 kHz

b. Source level: (dB re 1 µPa at 1 meter (m) (rms): 198 dB RMS

c. Number of beams, across track beam width, and along track beam width:
1 beam, downward focused at 16-32 degrees depending on center frequency.

d. Pulse rate and length: 4.5-13.5pps at 5-50 milliseconds.

e. Rise time: 12 µ seconds

f. Estimated distances to the 190 dB, 180 dB, and 160 dB re 1 uPa (rms) isopleths,
190 dB: 2.5M ; 180 dB: 8M ; 160 dB: 100M

These estimates are based on the underwater sound propagation equation:

RSPL= SL-20log (R/Ro)-AR, where

RSPL=received sound potential level

SL= RMS source level re. 1 uPa (rms) based on manufacturer's specifications

R= Distance

Ro= Reference Distance (1 m)

A= sound absorption coefficient

g. Deployment depth: 1 - 5 m

h. Tow speed: 3 - 5 knots

i. Approximate length of cable tow: 10m

Applied Acoustics CSP 1200 Sparker

a. Frequency (Hz, kHz): 825 Hz

b. Source level: (dB re 1 µPa at 1 meter (m) (rms): 205 dB RMS

c. Number of beams, across track beam width, and along track beam width:
1 beam, omnidirectional

d. Pulse rate and length: 250-1500 milliseconds depending on depth; 1180 µ seconds pulse length.

e. Rise time: 7 µ seconds

f. Estimated distances to the 190 dB, 180 dB, and 160 dB re 1 uPa (rms) isopleths,
190 dB: 6m ; 180 dB: 16m ; 160 dB: 166m

These estimates are based on the underwater sound propagation equation:

RSPL= SL-20log (R/Ro)-AR, where

RSPL=recieved sound potential level

SL= RMS source level re. 1 uPa (rms) based on manufacturer's specifications

R= Distance

Ro= Reference Distance (1 m)

A= sound absorption coefficient (0.06dB/km)

g. Deployment depth: 1 m

h. Tow speed: 4-5 knots

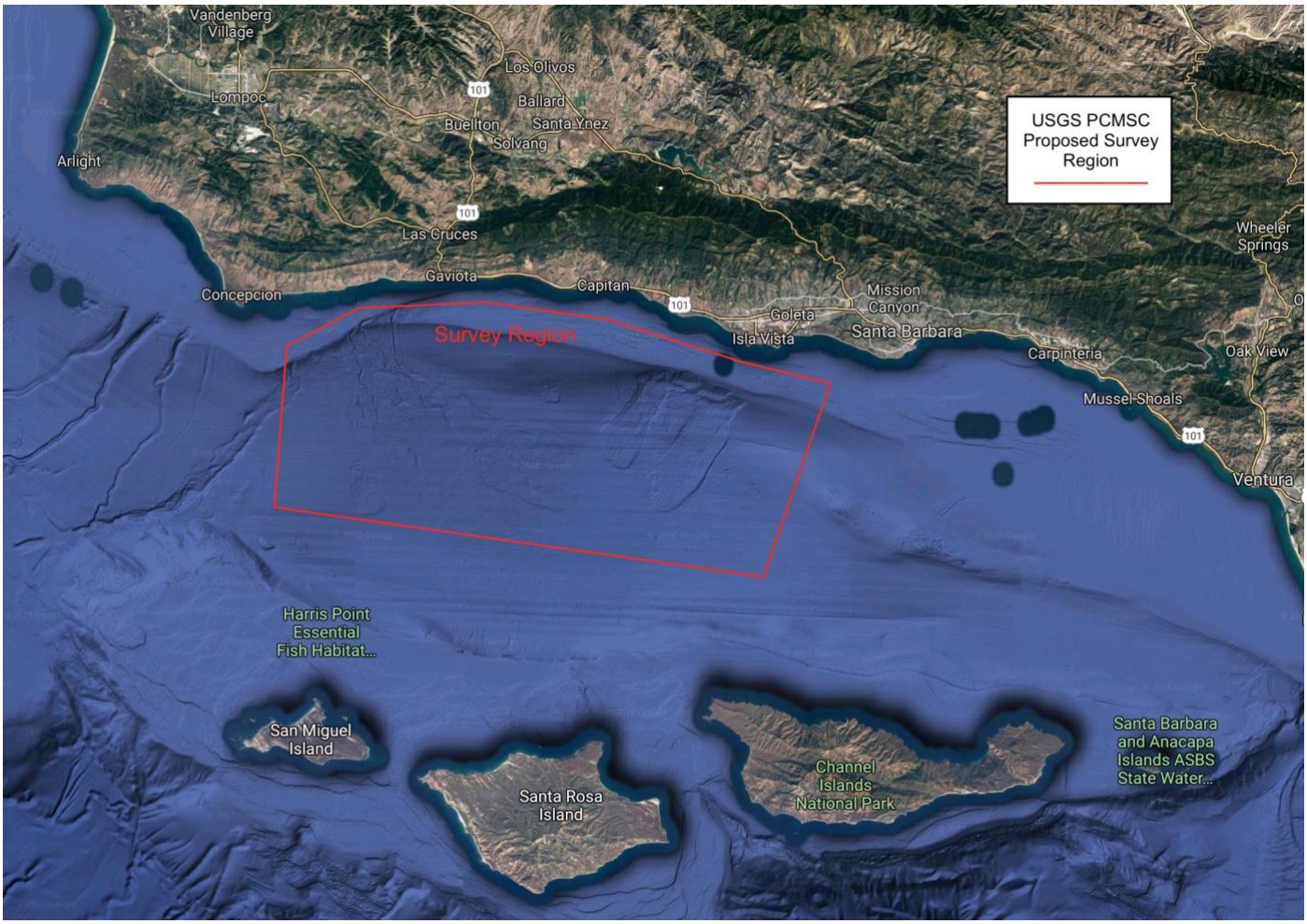
i. Approximate length of cable tow: 30 m.

Applicant's Representative:
Tim Elfers
US Geological Survey
2885 Mission Street
Santa Cruz, CA 95060
831-460-7479

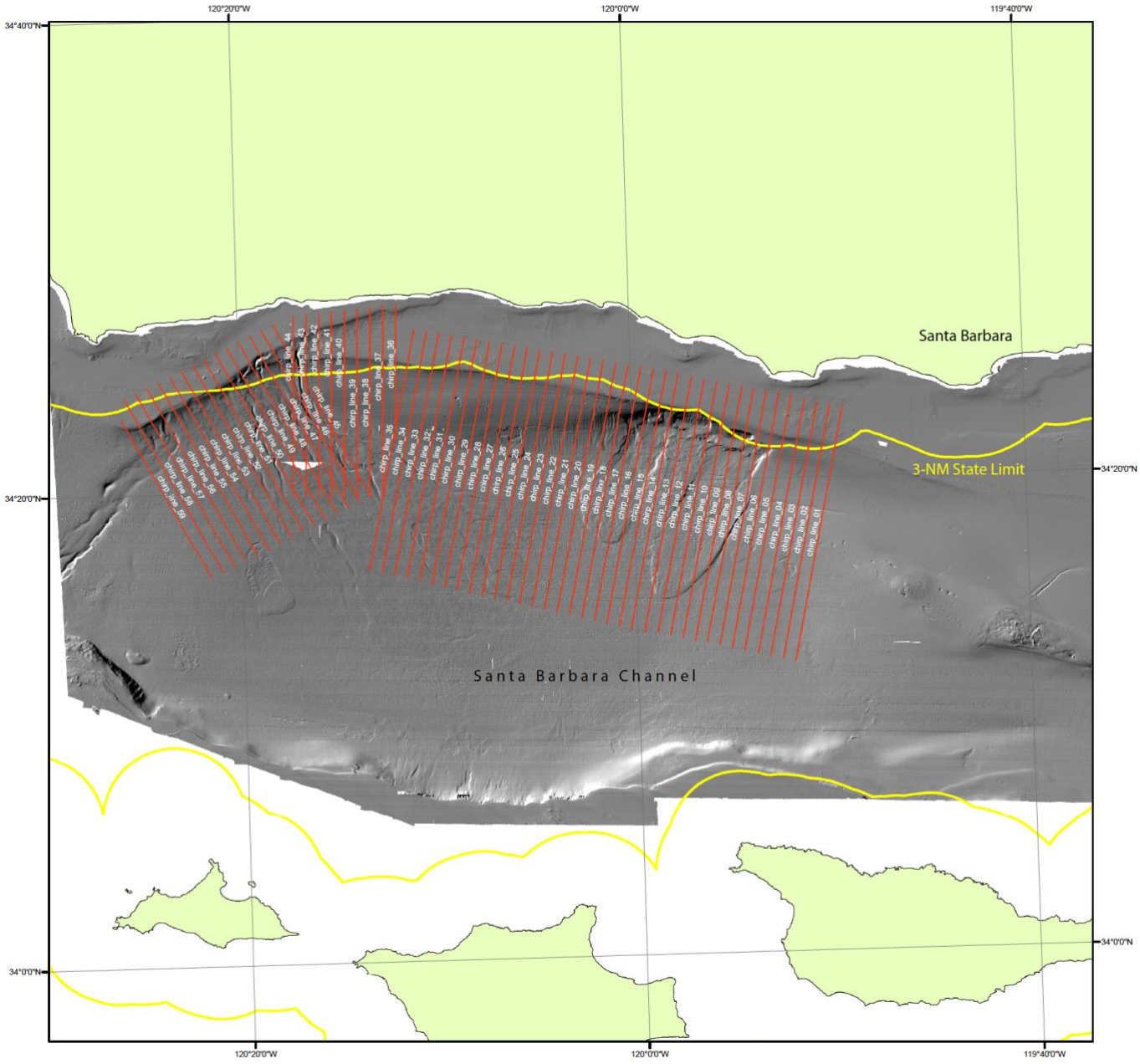
California State Lands Representative:
Richard B. Greenwood
Statewide Geophysical Coordinator
200 Oceangate, 12th Floor
Long Beach, CA 90802-4331
(562) 590-5201

BOEM Representative:
Joan Barminski
Chief, Office of Reservoir & Production
770 Paseo Camarillo
Camarillo, CA 93010
(805) 389-7707

Regional Map of Study Area


USGS PCMSC
Proposed Survey
Region
Survey Region
Vandenberg
Village
Lompoc
Los Olivos
Ballard
Santa Ynez
Buellton
Solvang
Arlight
Las Cruces
Gaviota
Capitan
Concepcion
Goleta
Isla Vista
Mission
Canyon
Santa Barbara
Carpinteria
Mussel Shoals
Wheeler
Springs
Oak View
Ventura
Harris Point
Essential
Fish Habitat...
San Miguel
Island
Santa Rosa
Island
Channel
Islands
National Park
Santa Barbara
and Anacapa
Islands ASBS
State Water...

Detail Map of Study Area



The survey area is bounded by the coordinates:

Upper L: 34.5074, -120.4378
Lower L; 34.2846, -120.4462
Upper R: 34.4061, -119.7208
Lower R: 34.1911, -119.7513

Survey track line coordinates:

Line #	North end of trackline		South end of trackline	
	start_lat	start_long	end_lat	end_long
chirp_line_01	34.3838	-119.8210	34.2046	-119.8671
chirp_line_02	34.3855	-119.8317	34.2068	-119.8776
chirp_line_03	34.3873	-119.8424	34.2091	-119.8881
chirp_line_04	34.3890	-119.8530	34.2113	-119.8986
chirp_line_05	34.3927	-119.8638	34.2135	-119.9099
chirp_line_06	34.3944	-119.8745	34.2157	-119.9204
chirp_line_07	34.3962	-119.8852	34.2180	-119.9309
chirp_line_08	34.3979	-119.8959	34.2202	-119.9415
chirp_line_09	34.4004	-119.9055	34.2212	-119.9515
chirp_line_10	34.4022	-119.9161	34.2234	-119.9620
chirp_line_11	34.4039	-119.9268	34.2257	-119.9726
chirp_line_12	34.4056	-119.9375	34.2279	-119.9831
chirp_line_13	34.4079	-119.9483	34.2280	-119.9945
chirp_line_14	34.4099	-119.9597	34.2301	-120.0059
chirp_line_15	34.4123	-119.9696	34.2325	-120.0158
chirp_line_16	34.4140	-119.9803	34.2348	-120.0263
chirp_line_17	34.4157	-119.9909	34.2370	-120.0369
chirp_line_18	34.4175	-120.0016	34.2393	-120.0474
chirp_line_19	34.4192	-120.0123	34.2415	-120.0579
chirp_line_20	34.4209	-120.0230	34.2438	-120.0684
chirp_line_21	34.4226	-120.0336	34.2460	-120.0789
chirp_line_22	34.4243	-120.0443	34.2483	-120.0894
chirp_line_23	34.4260	-120.0550	34.2505	-120.0999
chirp_line_24	34.4277	-120.0657	34.2528	-120.1105
chirp_line_25	34.4295	-120.0764	34.2550	-120.1210
chirp_line_26	34.4312	-120.0870	34.2573	-120.1315
chirp_line_27	34.4329	-120.0977	34.2595	-120.1420
chirp_line_28	34.4346	-120.1084	34.2618	-120.1525
chirp_line_29	34.4363	-120.1191	34.2640	-120.1631
chirp_line_30	34.4380	-120.1298	34.2663	-120.1736
chirp_line_31	34.4397	-120.1404	34.2685	-120.1841
chirp_line_32	34.4414	-120.1511	34.2708	-120.1946
chirp_line_33	34.4431	-120.1618	34.2730	-120.2051
chirp_line_34	34.4448	-120.1725	34.2752	-120.2157
chirp_line_35	34.4465	-120.1832	34.2775	-120.2262
chirp_line_36	34.4636	-120.1979	34.3687	-120.2011
chirp_line_37	34.4629	-120.2089	34.3282	-120.2133
chirp_line_38	34.4622	-120.2198	34.3285	-120.2242
chirp_line_39	34.4615	-120.2307	34.3288	-120.2350
chirp_line_40	34.4608	-120.2416	34.3290	-120.2459
chirp_line_41	34.4601	-120.2525	34.3293	-120.2568
chirp_line_42	34.4593	-120.2634	34.3296	-120.2676
chirp_line_43	34.4586	-120.2743	34.3298	-120.2785

chirp_line_44	34.4579	-120.2852	34.3301	-120.2893
chirp_line_45	34.4523	-120.3034	34.3293	-120.2230
chirp_line_46	34.4485	-120.3133	34.3254	-120.2328
chirp_line_47	34.4446	-120.3231	34.3214	-120.2426
chirp_line_48	34.4407	-120.3329	34.3174	-120.2523
chirp_line_49	34.4368	-120.3428	34.3135	-120.2621
chirp_line_50	34.4330	-120.3526	34.3095	-120.2719
chirp_line_51	34.4291	-120.3624	34.3055	-120.2816
chirp_line_52	34.4252	-120.3723	34.3016	-120.2914
chirp_line_53	34.4213	-120.3821	34.2976	-120.3011
chirp_line_54	34.4174	-120.3919	34.2936	-120.3109
chirp_line_55	34.4136	-120.4018	34.2897	-120.3207
chirp_line_56	34.4097	-120.4116	34.2857	-120.3304
chirp_line_57	34.4058	-120.4214	34.2817	-120.3402
chirp_line_58	34.4019	-120.4313	34.2777	-120.3499
chirp_line_59	34.3873	-120.4341	34.2738	-120.3597

Marine Wildlife Mitigation Plan
CHIRP imaging of geologic hazards along the outer shelf and slope, Santa Barbara Basin

(July 9th – July 17th, 2018)

1.0 INTRODUCTION

This marine wildlife mitigation plan is prepared in compliance with the USGS Pacific Coastal and Marine Science Center's existing State Geophysical Permit PRC 8394. This plan is intended to provide guidance to USGS vessel operators and scientific field personnel collecting geophysical data for the Pacific Coastal and Marine Science Center (PCMSC) in Santa Cruz, CA to avoid significant impacts to marine wildlife that may occur during regular geophysical surveys.

1.1 Regulatory Basis

Species that are either currently in danger or soon likely to be in danger of extinction throughout all or a portion of its range are protected by the Endangered Species Act of 1973. The United States Fish and Wildlife Service (USFWS), and the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) implement the Endangered Species Act. During the consultation with NMFS to issue a permit for the offshore geophysical survey, it was determined no incidental take permits are required to use the equipment identified in this document to conduct scientific data acquisition in federal waters offshore of the California coast.

1.2 Geophysical Survey Purpose and Objectives

The USGS Pacific Coastal and Marine Science Center (PCMSC) will collect geophysical data (high-resolution acoustic CHIRP and sparker sub bottom images), in both federal and California's State Waters, within the western Santa Barbara Channel. This work will occur primarily in federal waters and is designed to support USGS Marine Geologic Hazards Assessment projects, and also complement the seafloor mapping data collected in adjacent State Waters for the collaborative, multi-agency, California Seafloor Mapping Program (CSMP; http://walrus.wr.usgs.gov/mapping/csmp/). Data to be collected will document and enhance our understanding of shallow-subsurface geologic framework, active earthquake faults, submarine landslides, potential tsunami sources, petroleum seeps, and subsurface fluid flow. Baseline information will be specifically used to monitor change and assess geologic hazards. The work and databases will also stimulate and enable new research and enhance public education and awareness. Information will be specifically used for two purposes:

Geologic Hazard Assessment: This work maps near surface active faults, submarine landslides, seafloor seeps, and provides a high-resolution view of the shallow subsurface within the western Santa Barbara Channel. Such high-resolution imagery will provide a better understanding of potentially tsunamagenic seafloor failure processes occurring along the shelf edge and continental slope. In addition, information

gained during this study will provide insight into fault slip rates and earthquake recurrence intervals. Such information is used to inform building codes, conduct risk assessments, and determine insurance rates, and has significant economic impact.

Marine Zoning Monitoring: Information on geologic framework (including sediment distribution and thickness), fluid-flow processes, and geologic hazards (such as potential earthquake and tsunami sources) is fundamental to all coastal and marine spatial planning activities.

PCMSC will contact the NOAA Channel Islands Marine Sanctuary staff and local whale-watching operations to acquire information on the current composition and relative abundance of marine wildlife offshore as well as any pinniped haul out sites. Whale activity is moderate to high at the moment, with the NOAA Whale Advisory requesting avoid speeds in excess of 10 kts. Additionally, one day prior to survey activities, the NOAA Long Beach office, local whale watching operations will be contacted to get an update on marine wildlife sightings in the area. This information will be conveyed to the captain and crew prior to the survey.

A review of environmental responsibility of project operations will be conducted by the chief scientist in charge of the survey operations prior to commencing the first day of operations. When new personnel will be in the crew, this training will be repeated at least for those new to the crew. They will be made aware of their individual responsibility and will be shown how to be aware of possible environmental impacts and how to mitigate them during the geophysical survey operations. Information relating to seasonality, as an indication of the types of animals that might be in our survey area, at the time of survey work will also be presented to the crew. A copy of this document will be provided to the crew of our survey vessel.

All personnel will be expected to be consistently aware that they are to be alert to any presence of marine wildlife while they are performing their duties. There are a number of signs/indications of marine wildlife presence and each crew member will be responsible to maintain vigilance for those signs within the constraints of their project duties. Some of those indications are:

a. Sounds - such as splashing, vocalizations (by animals and birds), and blowing (breathing).

b. Visual indications - birds aggregating, changes in water character such as areas of rippled water, white water caused by splashing, changes in color or shape of the ocean surface.

1.3 Survey Schedule and Layout

The survey is scheduled to commence field activities on July 9th and is expected to conclude July 17th, 2018. The survey will be conducted aboard the USGS R/V Parke Snavely. The R/V Parke Snavely will be departing and returning daily to Santa Barbara harbor, and will be acquiring CHIRP profiles from July 9th-17th. An image of the survey area is shown in Figure 1. The survey will be conducted along proposed track lines (Figure 1). Proposed track lines extend along the mainland shelf break and continental slope. The track lines run across multiple fault zones and submarine landslides, and will cover both State waters and Federal waters. The survey timing is designed to take advantage of relatively favorable annual marine conditions

(low mean significant wave height and moderate seasonal winds). CHIRP and sparker profiles will be collected consistent with standard geophysical survey techniques. The survey speed will be approximately 3-5 nautical miles/hour.

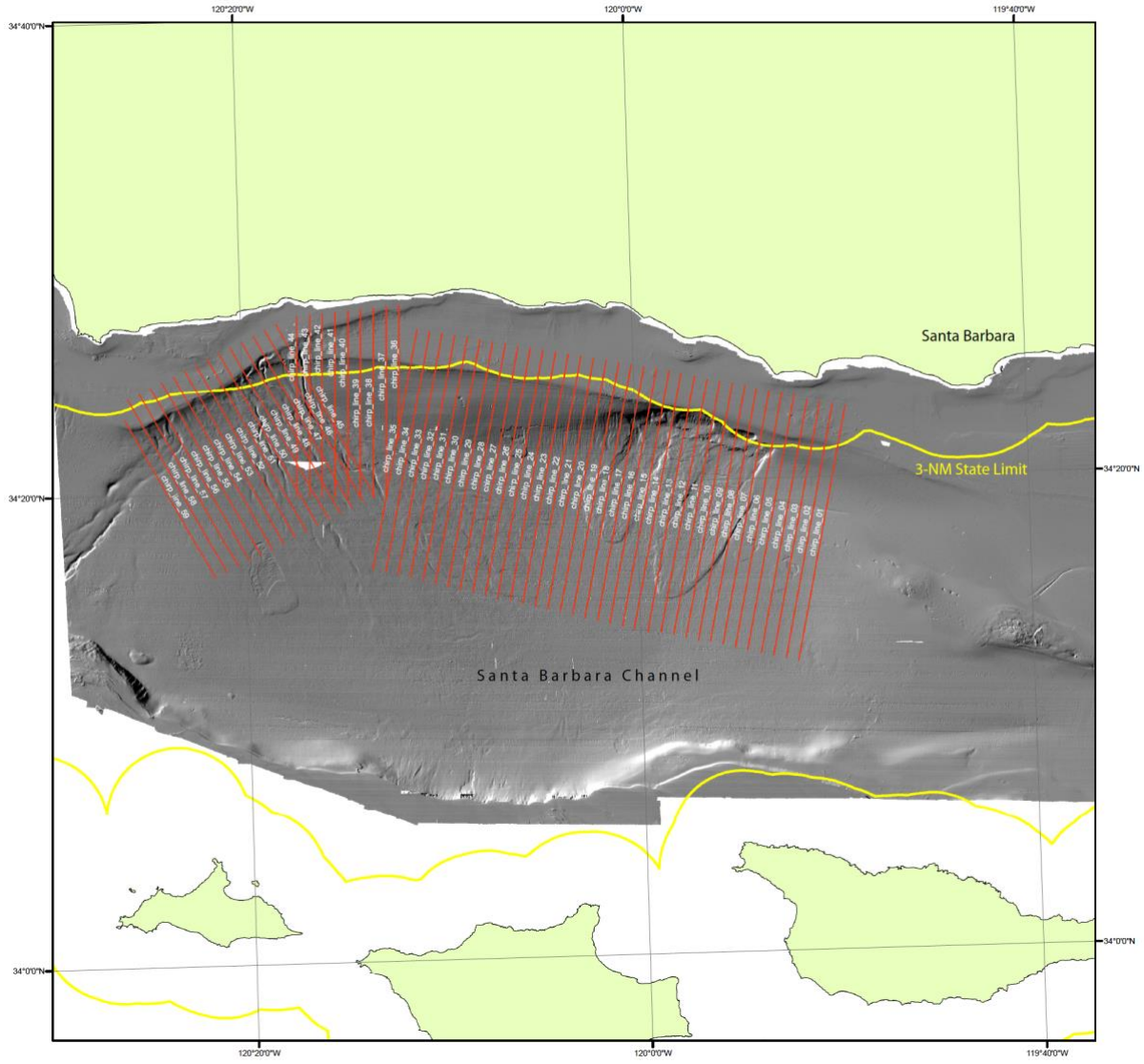


Figure 1. Region of Survey Area. Red lines are survey tracklines for daily operations onboard the R/V Parke Snavely

2.0 Survey Equipment and Activities

The survey vessel will be the R/V Parke Snavely, a 36 foot long, aluminum-hulled catamaran owned and operated by U.S. Geological Survey PCMSC. High resolutions sub bottom profile data will be collected during daylight hours using an Edgetech 512i CHIRP sonar fish that will be towed a few meters behind the survey vessel at water depths ranging from 1-5 meters. Sparker multi-channel profiles will also be collected in conjunction with CHIRP profiles.

PCMSC proposes to use the following equipment to collect the required data:

- Edgetech 512i CHIRP sub bottom profiler (active source).
- 1.2 kJ Sparker and Geometrics hydrophone array (active source)

The proposed survey will require the use of one marine vessel and in-water equipment that generate noise during data acquisition. The results of modeling of the noise generated by the survey equipment is shown in Table 1. Those results indicate that the area within which the 160 dB re: 1µPa rms sound level (the level specified by NOAA as potentially harmful to sensitive marine mammals) can be observed by monitors onboard the survey vessel. Because the acoustic data will be collected at an approximate speed of 3-5 knots, no area of the seafloor will fall within the sensitive sound level radius for more than about one minute.

Table 1. Distances to Received Pressure Levels from Equipment Sound Source

Sounder System	Frequency (kHz)	Source Level (dB peak)	Source Level (dB rms)	Distance toSL160 dB (rms) (meters)	Distance to SL 180 dB (rms) (meters)	Distance toSL190 dB (rms) (meters)
EdgeTech 512 Chirp	0.5-12 kHz	214	198	100	8	2.5
Applied Acoustics 1200 Mini Spraker	0.825	217	205	166	16	6

These estimates are based on the underwater sound propagation equation:

RSPL= SL-20log (R/Ro)-AR where,
RSPL=Received sound potential level
SL= RMS source level re. 1 uPa (rms) based on manufacturer's specifications
R= Distance
Ro= Reference Distance (1 m)
A= sound absorption coefficient

The greatest distance from the sound source to the 160 dB threshold for the chirp and sparker is 100 m and 166 m, respectively. These will be the equipment-specific safety zone radii observed during the survey.

3.0 Marine Wildlife

3.1 Marine Wildlife

The following discusses the marine wildlife that have been recorded within the project region, those taxa that are most likely to be within the project region during the survey, and methods that will be instituted by the vessel operator to reduce or eliminate potential impacts to marine wildlife during transit and survey operations. Assigned Marine Wildlife Observers (MWO), the vessel master and others in the vessel wheelhouse will watch for marine wildlife and will institute the aforementioned mitigations.

Table 2 provides information on the seasonal variations in the marine wildlife that are expected to be or have been reported within the Project area.

Table 2: Abundance Estimates for Marine Mammals and Reptiles of California Unless Otherwise Indicated

Common Name ***Scientific Name***	**Population Estimate**	**Current Population Trend**
REPTILES		
Cryptodira		
Olive Ridley turtle *Lepidochelys olivacea*	1.39 million (Eastern Tropical Pacific)**	Increasing
Green turtle *Chelonia mydas*	3,319-3,479** (Eastern Pacific Stock)	Increasing
Loggerhead turtle *Caretta caretta*	1,000 (California)**	Decreasing
Leatherback turtle *Dermochelys coriacea*	178 (California)**	Decreasing
MAMMALS		
Mysticeti		
California gray whale *Eschrichtius robustus*	18,017 (Eastern North Pacific Stock)	Fluctuating annually
Fin whale *Balaenoptera physalus*	2,624 (California/Oregon/Washington Stock)	Increasing off California
Humpback whale *Megaptera novaeangliae*	1,878 (California/Oregon/Washington Stock)	Increasing
Blue whale *Balaenoptera musculus*	2,046 (Eastern North Pacific Stock)	Unable to determine
Minke whale *Balaenoptera acutorostrata*	202 (California/Oregon/Washington Stock)	No long-term trends suggested
Northern right whale *Eubalaena japonica*	17 (based on photo-identification) (Eastern North Pacific Stock)	No long-term trends suggested
Sei whale *Balaenoptera borealls*	83 (Eastern North Pacific Stock)	No long-term trends suggested
Odontoceti		
Short-beaked common dolphin *Delphinus delphis*	343,990 (California/Oregon/Washington Stock)	Unable to determine
Long-beaked common dolphin *Delphinus capensls*	17,127 (California Stock)	Unable to determine
Dall's porpoise *Phocoenoides dalli*	32,106 (California/Oregon/Washington Stock)	Unable to determine
Harbor porpoise *Phocoena phocoena*	1,478 (Morro Bay Stock)	Increasing
Pacific white-sided dolphin *Lagenorhynchus obllquldens*	21,406 (California/Oregon/Washington Stock)	No long-term trends suggested
Risso's dolphin *Grampus griseus*	4,913 (California/Oregon/Washington Stock)	No long-term trends suggested
Short-finned pilot whale *Globicephala macrorhynchus*	465 (California/Oregon/Washington Stock)	No long-term trends suggested
Bottlenose dolphin *Turslops truncates*	684 (California/Oregon/Washington Offshore Stock)	No long-term trends suggested

	290 (California Coastal Stock)	No long-term trends suggested
Northern right whale dolphin *Llssopelphis borealis*	6,019 (California/Oregon/Washington Stock)	No long-term trends suggested
Sperm whale *Physeter macrocephalus*	751 (California/Oregon/Washington Stock)	No long-term trends suggested
Killer whale Orcinus orca	85 (Eastern North Pacific Southern Resident Stock)	Decreasing
	162 (Eastern North Pacific Offshore Stock)	No long-term trends suggested
Pinnipedia		
California sea lion *Zalophus californianus*	141,842 (U.S. Stock)	Unable to determine; increasing in most recent three year period
Northern fur seal *Callorhinus ursinus*	5,395 (San Miguel Island Stock)	Increasing
Guadalupe fur seal *Arctocephalus townsendi*	3,028 (Mexico Stock) Undetermined in California	Increasing
Northern (Steller) sea lion *Eumetopias jubatus*	2,479 California Stock	Decreasing
Northern elephant seal *Mirounga angustirostris*	74,913	Increasing
Pacific harbor seal *Phoca vitulina richardsi*	31,600	Stable
Fissipedia		
Southern sea otter *Enhydra lutris nereis*	2,711*	Unable to determine

Estimates provided by National Marine Fisheries Service (NOAA Fisheries 2011) *

Estimate provided by USGS (2010)

** Estimates provided by National Marine Fisheries Service (NMFS) (2004), Marquez, et al. (2002), Eguchi et al. (2007), Benson et al. (2007), and NMFS (2007). Estimates are based on number of current numbers of nesting females.

During the transit periods, there is a potential for encountering marine wildlife and therefore onboard monitoring will occur. Table 3 lists those species that are likely to occur in the survey area.

Table 3. Marine Wildlife Species and Most Likely Periods of Occurrence within the Survey Area

Family Common Name	Month of Occurrence [1]											
	J	F	M	A	M	J	J	A	S	O	N	D
REPTILES												
Cyptodira												
Olive Ridley turtle *(T)* [2]												
Green turtle (T)[1],[2]												
Loggerhead turtle (T) [2]												
Leatherback turtle (E) [2]												
MAMMALS												
Mysticeti												
California gray whale												
Blue whale (E)												
Fin whale (E)												
Humpback whale (E)												
Minke whale												
Sei whale (E)												
Northern right whale (E)												
Odontoceti												
Short-beaked common dolphin												
Dall's porpoise												
Harbor porpoise												
Long-beaked common dolphin												
Pacific white-sided dolphin												
Risso's dolphin												
Sperm whale												
Short-finned pilot whale												
Bottlenose dolphin												
Northern right whale dolphin												
Killer whale												
Pinnipedia												
Northern fur seal [3]												
California sea lion												
Northern elephant seal [4]												
Pacific harbor seal												
Guadalupe fur seal (T)												
Steller sea lion												
Fissipedia												
Southern sea otter (T) [5]												
Relatively uniform distribution		Not expected to occur					Most likely to occur due to seasonal distribution					

(E) Federally listed endangered species.
(T) Federally listed threatened species.
(1) Not Used
(2) Rarely encountered, but may be present year-round. Greatest abundance during July through September.
(3) Only a small percent occur over continental shelf (except near San Miguel rookery, May-November).
(4) Common near land during winter breeding season and spring molting season.
(5) Only nearshore (diving limit 100 feet).
Sources: Bonnell and Dailey (1993), NOAA Fisheries (2011), NCCOS (2007)

4.0 ONBOARD MITIGATIONS

4.1 Fishing Gear Clearance

In addition to submitting the required Notice to Mariners that will advise commercial fishers of pending on-water activities, prior to the start of each survey day, the vessel will traverse the proposed survey corridor for that day to note and record the presence of deployed fishing gear. No survey lines within 30 m (100 ft) of the observed fishing gear will be completed. The survey crew will not remove or relocate any fishing gear; removal or relocation will only be accomplished by the owner or by an authorized California Department of Fish and Game (CDFG) agent.

4.2 Survey Monitoring

At all times during survey activities, at least two designated marine wildlife monitor (MWO) will be present on the vessel. In addition, the vessel masters have experience with marine wildlife monitoring and will observe and announce any sightings. The onboard MWO shall have the authority to stop operations if a mammal or turtle is observed within the specified safety zone. We will make contact with the NOAA Long Beach office and local whale watching organizations prior to commencement of operations to acquire information on the current composition and abundance of marine wildlife offshore and convey sighting data to the vessel crew and MWOs prior to departure. The certification of MWOs is provided in Appendix A.

The MWO will survey an area at least 200 m in all directions centered on the sound source (towed array behind the vessel) throughout the period of time that the survey equipment is operating. This 200 m visual range will encompass the 100 - 166 m safe radius distance.

If a monitor observes a marine mammal approaching the safety zone, the equipment will be shut down and will be re-started (ramped up) only when the MWO is assured that there is no longer the possibility of marine wildlife entering the safety zone.

The onboard monitors will have the authority to require that operations be stopped if a mammal or turtle is observed approaching the specified safety zone or appears to be negatively affected by the survey activities. The monitors will also have the authority to recommend continuation (or cessation) of operations during periods of limited visibility (i.e. fog) based on the observed abundance of marine wildlife. Periodic reevaluation of weather conditions and reassessment of the continuation/cessation recommendation will be completed by the onboard monitors.

4.3 Mitigations During Transit and Survey

During daily transits, there is a potential for encountering marine wildlife. Onboard monitoring will be conducted by MWO's, the vessel master, and science crew. During transits the vessel will maintain a minimum distance of 100 m from observed animals. If the vessel master observes a marine mammal within the path of the transiting vessel, they will immediately slow the vessel and/or change course in order to avoid contact.

Cetaceans (whales) vary in their swimming patterns and duration of dives and therefore all shipboard personnel will be watchful as the vessel crosses the path of a whale or anytime whales are observed in the area.

If whales are observed during transits, the vessel master will institute the following measures:

- Maintain a minimum distance of 130 m from sighted whales;
- Do not cross directly in front of or across the path of sighted whales;
- When transit directions is parallel to whale path, maintain constant speed that is not greater than the whales speed, or alter transit direction away from whale path;
- Do not position the vessel in such a manner to separate female whales from their calves;
- If a whale engages in evasive or defensive action, slow the vessel and move away from the animal until the animal calms or moves out of the area.

During survey operations, the vessel will maintain survey a speed of 4-5 knots and will maintain a heading that coincides with survey track lines. If marine wildlife is observed within the vicinity of the vessel, the vessel master will take precautions to avoid proximity to marine wildlife (collision), ending and restarting the track line survey if necessary.

If a collision with marine wildlife occurs, the vessel master will document the conditions under which the accident occurred, including the following:

- Location of the vessel when the collision occurred (latitude and longitude);
- Date and time;
- Speed and heading of the vessel;
- Observed conditions (e.g., wind speed and direction, swell height, visibility in miles or kilometers, and presence of rain or fog);
- Species of marine wildlife contacted; and
- Organization, vessel ID and name of master in charge of the vessel at time of accident.

In accordance with NOAA requirements, after a collision, the vessel should stop, if safe to do so. The vessel may proceed after confirming that it will not further damage the animal by doing so. The vessel will then communicate by radio or telephone all details to the vessel's base of operations. The PCMSC Marine Operations Superintendent will contact the Stranding Coordinator, NMFS, Southwest Region, Long Beach, to obtain instructions. Alternatively, the vessel captain may contact the NMFS Stranding Coordinator directly using the marine operator to place the call or directly from an onboard telephone, if available to:

NOAA Southwest Regional Stranding Coordinator
National Marine Fisheries Service
501 West Ocean Blvd, Suite 4200
Long Beach, CA 90802-4213
562-980-3230
Contact: Justin Viezbecke
Email: justin.viezbicke@noaa.gov

It is unlikely that the vessel will be asked to stand by until NOAA or CDFG personnel arrive, however this will be determined by the Stranding Coordinator. According to the MMPA, the vessel operator is not allowed to aid injured marine wildlife or recover the carcass unless requested to do so by the NOAA Stranding Coordinator.

Although NOAA has primary responsibility for marine mammals in both state and federal waters, the CDFG will also be advised that an incident has occurred in state waters affecting a protected species. Reports should be communicated to the federal and state agencies listed below:

Federal	**State**	**State**
Justin Viezbicke, Stranding Coordinator Southwest Region National Marine Fisheries Service Long Beach, California (562)980-3230	Enforcement Dispatch Desk California Department of Fish and Game Long Beach, California (562)590-5132	California State Lands Commission Division of Environmental Planning and Management Sacramento, California (916) 574-1938

4.4 Operational Measures

Operational measures to reduce impacts to marine mammals or turtles will include: 1) soft-start technique, 2) acoustic safety zone radii, 3) slow vessel speeds, 4) avoidance of pinniped haul out sites, and 4) limitations on equipment usage.

a) Soft Start

The soft-start technique will involve initiating the sparker and chirp at the lowest practical sound level, increasing the output in such a manner as to increase in steps not exceeding approximately 6 decibels per 5-minute period. During this time, MWOs will monitor the safety zone for marine mammal or turtle sightings.

b) Safety Zone Monitoring

The safety zone monitoring will follow the protocols outlined in Exhibit H of the Permit (PRC 8394), which sets a safety zone of 100 m for the chirp sub-bottom profiler and 166 m for the sparker as specified in Table 1. In the event that a pinniped haul out site is located within 300 m of the survey boundary, USGS will take the following measures:

- Not approach within 300 m of the haul-out site (consistent with NMFS guidelines);
- Expedite survey activity in this area in order to minimize the potential for disturbance of pinnipeds on land;
- Have the MWM monitor pinniped activity onshore as the vessel approaches, observing and reporting on the number of pinnipeds potentially disturbed;
- Pinniped haul out site locations are given in Table 4.

The vessel will continuously monitor the daily survey area to ascertain the presence, species and location of any marine wildlife is apparent in the intended survey area. The MWO and onboard personnel will be watchful as the vessel crosses this path or anytime whales are observed in the area. The vessel operator shall observe the following guidelines:

- Make every effort to maintain distance from sighted marine mammals and other marine wildlife;
- Do not cross directly in front of (perpendicular to) migrating whales or any other marine mammal or turtle;
- When paralleling marine mammals or turtles, the vessel will operate at a constant speed that is not faster than that of the animals;
- Care will be taken to ensure female whales are not separated from their calves; and, if a whale engages in evasive or defensive action, the vessel will reduce speed or stop until the animal calms or moves out of the area.

c) Vessel Speed

Survey speeds for CHIRP data acquisition will be approximately 3 to 5 knots for maximum data accuracy and data quality.

d) Limitations on equipment usage

Limitations on the frequency, pulse length, and pulse rate will be implemented to reduce potential harmful noises. For the CHIRP and Sparker systems, the highest frequency band possible will be used and the shortest possible pulse length and lowest pulse rate will be used.

Table 4 Pinniped Haul Out Locations

LOCATION	SPECIES	LATITUDE	LONGITUDE
Goleta, CA	Harbor Seal	N 34.20°	W 119.81°

4.5 Monitoring Reporting

A Post Survey Field Operations and Compliance Report will be submitted to CSLC staff as soon as possible but no more than 30 days after the completion of survey activities.

APPENDIX A: MARINE WILDLIFE OBSERVER CERTIFICATIONS

Since 2006, the USGS Pacific Coastal and Marine Science Center has provided trained marine mammal observers in support of low power geophysical surveys in California State Waters and Federal Waters under NOAA National Marine Fisheries (NMFS) jurisdictions. These surveys have been conducted under permit authorizations from California State Lands Commission (CSLC) (Permit# PRC 8394) and various NMFS Incidental Harassment Authorizations (IHAs) and Letters of Concurrence. PCMSC has provided training for 136 of their staff research scientists and science and technical support staff as marine wildlife observers (MWO) to support our geophysical surveys and meet our marine mammal mitigation obligations under pursuant to our CSLC and NMFS permit requirements.

The MWO training for our science and technical support staff is provided by Dr. James Harvey, a Professor of Marine Science at MLML and the Interim Director of MLML. Jim has taught courses on the biology and ecology of marine turtles, birds, and mammals for 22 years. Jim has also advised more than 70 graduate students as they obtained their M.S. degree, and has all of the instructional material (handouts, identification manuals, slides, video, etc.) for teaching this workshop.

The training has been conducted during several 2 day workshop at Moss Landing Marine Laboratories on the identification of marine mammal species, including handouts, slides, and video. All species of marine mammals in the area of planned USGS activities were discussed, their status and trends, and identifying features that allow species identification, and possibly differentiation between sexes and age classes. The workshop participants were instructed in the “normal” behaviors of marine mammals using visual explanations, slides, and video. A typical data sheet was prepared and participants were instructed how they would complete the data form. The rationale for the need for trained observers and importance of the data was emphasized. This training concluded with an observational cruise aboard an MLML vessel on Monterey Bay to observe the marine mammals discussed in the course in their natural setting and receive identification tips and other information in a field setting similar to that which they would expect during science operations.

PCMG Certified Marine Mammal Observers

Observer Name	Staff Position
Alicia Balliser-Gee	Science Support
Ginger Barth	Research Scientist
Jayne Bormann	Science Support
Daniel Brothers	Research Scientist
Katherine Coble	Research Scientist
Guy Cochrane	Research Scientist
Jamie Conrad	Research Scientist
Peter Dartnell	Science Support
Pete Dal Ferro	Science Support - Vessel Master
Theresa Fregoso	Science Support
Steven Hartwell	Science Support
Patrick Hart	Research Scientist
Sam Johnson	Research Scientist
Simon Klemperer	Research Scientist
Jared Kluesner	Research Scientist
Sean Paul LaSelle	Science Support
Tom Lorenson	Science Support
Brent Lunghino	Science Support
Tom Parsons	Research Scientist
Carol Reiss	Science Support
Ray Sliter	Science Support
Mike Torresan	Science Support
Peter Triezenberg	Science Support
Steve Watt	Research Scientist
Janet Watt	Research Scientist
Jenny White	Science Support - Vessel Master
Jeff Beeson	Science Support

APPENDIX B: VESSEL OPERATIONS DAILY PLAN

Operational Plan for USGS Southern California geophysical survey (7/9/2018 to 7/17/2018)

Note: The schedule below anticipates optimal circumstances in which there are no significant equipment problems and no days in which weather (e.g., excessive wind or large swells, heavy fog) restricts operations. Any of the above can result in schedule adjustments, however with good weather, the survey should be completed in within the proposed timeframe.

Day 1 - Day 9. July 9 (Monday) through July 17 (Tuesday) daylight hours: Early AM departure from Santa Barbara Harbor. Transit to survey area in western Santa Barbara Basin. Collection of low-energy CHIRP and sparker subbottom profile data on SW-NE trending tracklines. Return to Santa Barbara Harbor.

U.S. GEOLOGICAL SURVEY
PACIFIC COASTAL AND MARINE GEOLOGY SCIENCE CENTER

MANAGEMENT OF ACCIDENTAL DISCHARGE AND VESSEL INCIDENTS DURING OFFSHORE GEOPHYSICAL SURVEYS

1.0 INTRODUCTION

The survey operations will be conducted aboard the USGS Research Vessel Parke Snavely, a 36 foot aluminum catamaran powered by twin Volvo Penta diesel engines. Because of the vessel's relatively small size, it is anticipated that response to any operational spills will be quickly identified and response will be initiated quickly and efficiently by the vessel master and on board designated vessel crew. At the initiation of each project or project phase, a spill management review will be conducted by the vessel master who is in all cases the responsible authority. Oil spills in United States (U.S.) marine waters shall be reported immediately.

2.0 OPERATIONAL SPILLS

Operational spills might involve one or more of the following substances carried on board the vessel: (i) fuel; (ii) lube oil; (iii) hydraulic oil; or (iv) waste oil. The vessel is equipped with a Buffalo Quick-Response Oil Spill Kit, which includes socks for fast spill containment (three 4" socks), woven polypropylene sheets (15 sheets) for rapid absorption of surface oil and protective gear, protective gloves (1 pair), disposal bag (1), and a set of instructions. This oil spill kit is located in the forward cabin of the vessel. This spill kit is rated to clean up 5 gallons of liquid. All of the liquids (listed below) that could cause a hazardous spill are either in the fuel tank or are located in the aft deck engine maintenance compartment of the vessel. Thus, if a spill occurred, these would be contained in the engine or maintenance compartments or, or if a grounding or instance occurred that punctured the gas tank, this would leak into the water, which is beyond the scope of our cleanup efforts. In the event a spill occurred in the engine compartment, the oil spill kit would be used to contain the hazardous liquids and the bilge would not be emptied until it could be pumped out at a hazardous waste facility. We do not anticipate a spill of greater than 5 gallons.

(i) Fuel:

A spill kit shall be available for use in the event of a spill. If the fuel is spilled on the deck, it shall be immediately removed, bagged and disposed of at an appropriate hazardous waste reception facility. In the event of spillage in the water, the vessel master shall notify the Coast Guard and port facility.

(ii) Lube oil:

A spill kit shall be available for use in the event of a spill. If the oil is spilled on deck or in the machinery space, it shall be immediately removed, bagged and disposed of at an appropriate hazardous waste reception facility. In the event of spillage in the water, the vessel master shall notify the Coast Guard and port facility.

(iii) Hydraulic oil:

A spill kit shall be available for use in the event of a spill. If the oil is spilled on deck or in the machinery space, it shall be immediately removed, bagged and disposed of at an appropriate hazardous waste reception facility. In the event of spillage in the water, the vessel master shall notify the Coast Guard and port facility.

(iv) Pipe leakage:

The vessel master shall check the piping and rubber hose daily for leakage. Where leakage is found, it shall be repaired immediately, in the event of leakage, the vessel deck engineer shall secure valve(s) at the appropriate tank before repairing the leak. Spilled fuel on the vessel shall be immediately removed, bagged and disposed of at an appropriate hazardous waste reception facility. In the event of spillage in the water, the vessel master shall notify the Coast Guard and port facility.

3.0 EMPLOYEE TRAINING ON OIL SPILL CONTINGENCY PLAN

Prior to the launching of the vessel for any activities, all captain and crew members on the vessel will have read the Oil Spill Contingency Plan, understand procedures to be implemented in the event of an oil spill, and know where the oil spill kit is located on the vessel.

4.0 VESSEL FUELING

All vessel fueling will be conducted at an approved docking facility. No cross vessel fueling will be performed. Appropriate spill avoidance measures during filling procedures will be observed.

5.0 PRIORITY ACTIONS TO ENSURE PERSONNEL AND VESSEL SAFETY

Safety of vessel personnel and the vessel are paramount. In the event that a crewman's injuries require outside emergency assistance, the PCMSC safety officer shall be contacted immediately and emergency personnel contacted. While awaiting emergency assistance, the on board vessel master or qualified vessel crew personnel will render first aid and/or CPR. The nearest emergency medical facilities for this area is:

Santa Barbara College Hospital
400 W Pueblo St, Santa Barbara, CA 93105
(805) 682-7111

6.0 MITIGATING ACTIVITIES

If safety of both the vessel and the personnel has been addressed, the vessel master shall care for the following issues:

- Assessment of the situation and monitoring of all activities as documented evidence.
- Care for further protection of the personnel, use of protective gear, assessment of further risk to health and safety.

- Containment of the spilled material by absorption and safe disposal within leak proof containers of all used material onboard until proper delivery ashore, with due consideration to possible fire risk.
- Decontamination of personnel after finishing the cleanup process.

All personnel shall refer to the MSDS's on board for additional information.

7.0 EMERGENCY CONTACTS FOR STATE AND FEDERAL AGENCIES

Emergency numbers for U.S.C.G. for the San Francisco and Central Coast Areas are:

Pacific SAR Coordinator - Alameda: 510-437-3700

Rescue Coordination Center, Alameda: 510-437-3700

Any oil spill in U.S. marine waters shall be reported immediately to the following state and agencies:

West Coast Oil Spill hot-line	800-OELS-911, *or*
Department of Fish and Game CalTIP	888-CFG-CALTip
(Californians Turn In Poachers & Polluters)	(888-334-2258). *and*
U.S. Coast Guard National Response Center	800-424-8802
California Office of Emergency Services (OES)	800-OILS-911 or 800-852-7550.

During the phone call, the following information will be given over the phone.

a. Name and telephone number of caller.
b. Spill location
c. What was spilled (oil, gas, diesel, etc.)
d. Estimated size of spill
e. The date & time spill was identified (same day).
f. Any oiled or threatened wildlife
g. Source of spill, if known
h. Activity observed at the spill site

After taking the necessary actions, the spill will be reported in writing to the Governor's Office of Emergency Services on their forms.

Additionally, California Department of Fish and Game certified wildlife rescue/response organizations will be contacted about the spill. In the Southern California area, these include the following contacts:

Oiled Wildlife Care Network	Animal Advocates
1-877-UCD-OWCN	323-651-1336
California Wildlife Center	South Bay Wildlife Rehab
310-458-9453	310-378-9921

U.S. GEOLOGICAL SURVEY
PACIFIC COASTAL AND MARINE SCIENCE CENTER

GEOPHYSICAL SOUND SOURCE SYSTEMS MAINTENANCE RECORD

Edgetech 512i Chirp Sub Bottom Profiler

1.0 Introduction

The USGS Pacific Coastal and Marine Science Center (PCMSC) owns and operates a broad range of geophysical sound sources, seafloor mapping systems, geologic and geotechnical sediment sampling systems, and oceanographic instrument systems. This requires considerable technical and operational support to successfully undertake and complete its field programs. Operational and technical support for these systems is provided by the PCMSC Marine Operations Facility (Marfac) in Santa Cruz, CA. Our Marfac group is staffed by a team of ten ocean engineers, electronics technicians, and marine engineering technicians. They operate, maintain and repair all geophysical and oceanographic systems used to support all of PCMSC's scientific field operations.

The USGS-owned Edgetech Chirp 512i, s/n 027065, Sub Bottom Profiler sound source and top side deck units were given a thorough checkout and complete electrical test as per manufacturer's recommended procedures on Sept 29, 2017. All tests were passed and the system was determined to be within specified operational parameters.

Rob Wyland, Ocean Engineer

9/29/17
Date

3200 Check-Out Procedure

Rack S/N: 027065
Amp S/N: 027061
Computer S/N: 391043

- Attach a keyboard, and mouse. Turn power amplifier on. Boot system. ☒
- Run *pickfish* application in Apps folder on desktop. Select SB512i towfish. ☒
- Run Sub-Bottom acquisition software. Set: pulse power to 100%, ping rate @ 5 Hz.
- Verify LED's on Rear panel work (where applicable) ☒TX1☒TX2.
- Measure 12V on Rear Panel: 12VDC+/-0.5☒ Measured V=11.9.
- Measure Towfish Preamp Voltage on Rear Panel: 5VDC+/-0.5☒ Measured V=5.01.

Towfish Model: SB-424☐ **SB-216A2**☐ **SB-216D** ☐ SB-512☐ SB-0512I ☒ **SB-0408**☐
Towfish S/N: 68186
Tow cable Model and Length: Standard 20m.

- Using an oscilloscope, measure output voltage at the Amp output pins (see fig. 1). Measure each side with respect to ground. Typical readings range from 150vp-p to 200vp-p. Record results in table 1.

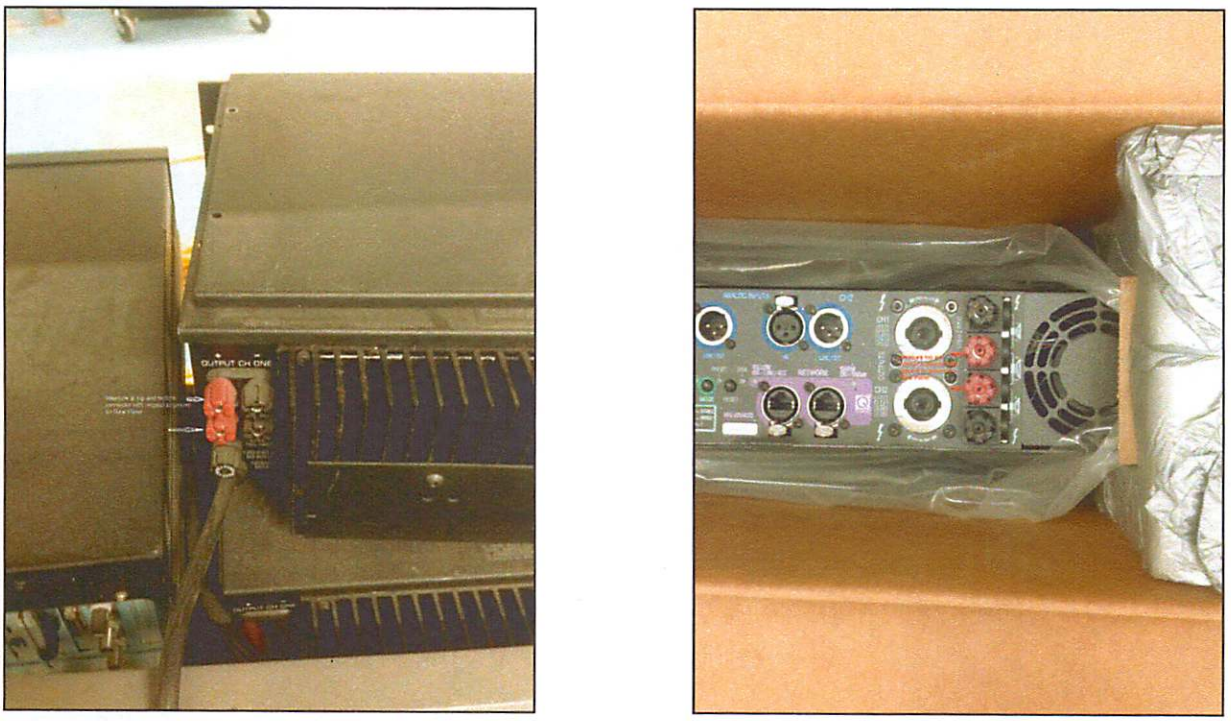
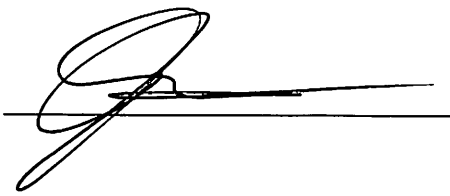


Fig. 1 (old & new style amp)

Table 1

Item	Pulse Description	V-pp @ 100% PP Side E	V-pp @ 100% PP Side H	Verify Not Clipping Side E	Verify Not Clipping Side H
512i	.4-4.0khz_40ms WB	80.72/-78.88	78.07/-80.45	X	X
512i	1.0-6.0khz_40ms	85.17/-85.27	84.45/-84.55	X	X
512i	.5-7.0khz_20ms WB	94.21/-96.11	94.81/-93.82	X	X
512i	.7-12khz_20ms (FM)	82.88/-82.98	82.16/-82.38	X	X
512i	2-12khz_20ms (FM)	82.04/-82.02	81.32/-81.41	X	X
512i	1-10khz_5ms (FM)	77.46/-78.16	77.10/-77.20	X	X
512i	.5-2.7 khz_100ms (FM)	80.72/-80.93	80.11/-80.21	X	X
512i	.5-4.5 khz_50ms (FM)	88.06/-88.28	87.34/-87.68	X	X
512i	.5-6.0 khz_9ms (FM)	87.46/-87.56	86.50/-86.96	X	X
512i	.5-7.2 khz_30ms (FM)	86.74/-86.83	85.65/-86.11	X	X
512i	.5-8.0 khz_5ms (FM)	78.67/-78.88	77.58/-78.16	X	X
512i	.5-2.7 khz_40ms (WB)	N/A	N/A	N/A	N/A

Administered by:  Date: 6/29/16

U.S. GEOLOGICAL SURVEY
PACIFIC COASTAL AND MARINE SCIENCE CENTER

GEOPHYSICAL SOUND SOURCE SYSTEMS MAINTENANCE RECORD

Applied Acoustics CSPD-1200 Sparker

1.0 Introduction

The USGS Pacific Coastal and Marine Science Center (PCMSC) owns and operates a broad range of geophysical sound sources, seafloor mapping systems, geologic and geotechnical sediment sampling systems, and oceanographic instrument systems. This requires considerable technical and operational support to successfully undertake and complete its field programs. Operational and technical support for these systems is provided by the PCMSC Marine Operations Facility (Marfac) in Santa Cruz, CA. Our Marfac group is staffed by a team of ten ocean engineers, electronics technicians, and marine engineering technicians. They operate, maintain and repair all geophysical and oceanographic systems used to support all of PCMSC's scientific field operations.

The USGS-owned Applied Acoustics CSPD-1200 Sparker sound source was purchased new and delivered in April 2016. The manufacturer guarantees the equipment is within specified operational parameters and fully compliant with Applied Acoustics stated capabilities and specifications.

Jackson Currie, Electronics Technician — Date: 10/19/17

CALIFORNIA AIR RESOURCES BOARD TIER 2 ENGINE CERTIFICATION

MM-AIR-1: Engine Tuning, Engine Certification, and Fuels

The following information is provided as required for compliance with Mitigation Measure *(MM) AIR-1: Engine Tuning, Engine Certification, and Engine Fuels*. The USGS Research Vessel Parke Snavely is a 36 ft., 2007 catamaran work boat. The vessel was built for USGS by Armstrong Marine in Port Angeles, WA and was delivered with two Volvo Penta D6-310 HP diesel engines. These engines comply with IMO NOx limits and the comprehensive emission requirements (EU RCD and US EPA Tier 2, rating 5 Marine Leisure and rating 4 Marine Commercial).

Regarding the NOx emissions, MM AIR-1 states that daily NOx emissions should not exceed 100 pounds based on engine certification emission factors. This can be accomplished with Tier 2 engines if daily fuel use is 585 gallons or less. This vessel only holds 150 gallons and has an efficiency of about 2 miles per gallon. Thus, on our survey, we expect to cover approximately 10-15 miles total, for an estimated maximum fuel consumption of 30 gallons.

The manufacturer's specifications for these engines is provided below.

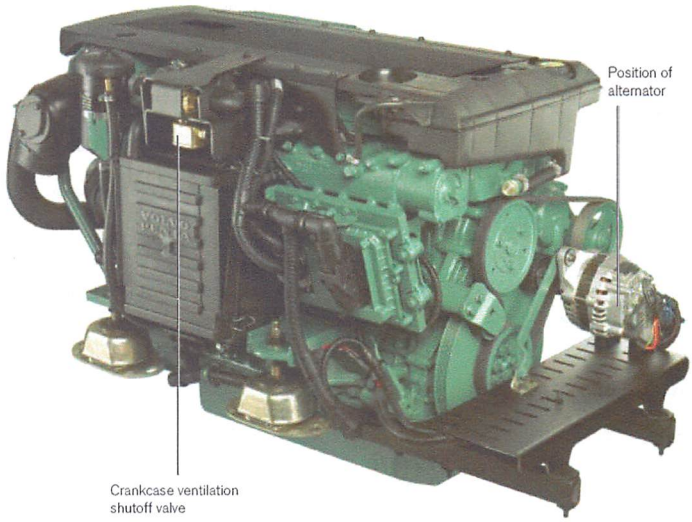
Life- and Rescue Boat Propulsion Engines

D4/D6 SOLAS

132–272 kW (180–370 hp) crankshaft power acc. to ISO 8665

New powerful D4/D6 SOLAS range

Volvo Penta has now introduced a new powerful SOLAS approved range for use in fast rescue boats, lifeboats and tender boats: the D4-180, D4-225, D4-260, D6-280, D6-310, D6-330, and D6-370 common rail marine diesel engines with rating 4 and 5 power settings. The engines are SOLAS approved for both inboard, waterjet and sterndrive propulsion.



Designed to withstand the tough Life- and Rescue boat environment

The D4/D6 Life- and Rescue boat engines are designed to comply with the requirements in the following regulations and standards:

- Council Directive 96/98/EC, as amended by Commission Directive 2002/75/EC
- SOLAS 74 Convention, as amended, Reg. III/4 and Reg. III/34
- LSA Code
- IMO Resolution MSC. 48(66)
- IMO Res. MSC. 81(70), Part 1, paras. 6.10.2 to 6.10.6 and 6.14.6 to 6.14.8.
- U.S.C.G.

SOLAS specifications

The SOLAS regulations specify the following demands for the engine:

- Withstand free fall of the lifeboat from 3 meters
- Withstand a lateral impact of 3.5 m/s of the lifeboat
- Stop automatically on capsizing and easily restart
- Fuel and lubricating systems shall prevent the loss of fuel and oil during capsizing
- Work submerged in water to the crankshaft centerline
- Work for not less than 5 min. after starting cold with the lifeboat out of the water
- Run properly at an angle of up to 10° trim and an angle of up to 20° list, either way
- Manual starting system or power starting system with two independent sources
- The lifeboat engine shall be designed to limit electromagnetic emissions
- The engine to be started without heater down to –15°C (–30°C with heater)

Standard high performance engines

All SOLAS engines are based on standard engine designs with SOLAS kits mounted and are tested in factory before delivery to boat builders. The major changes are a new position of the existing alternator and a new crankcase ventilation shutoff valve.

The design will extend the engine by approx. 270 mm in fore end to accommodate the new position of the alternator. The void space can be used to accommodate the batteries, as usual. See the drawing on page 2 for more information regarding dimensions of the SOLAS kit for D4/D6.

The SOLAS kit also includes a tilt switch, to be mounted on the engine bulkhead.

The base engine mounts are originally designed for high G-forces. Thus, there is no need for extra reinforcement for fast rescue boats and lifeboat applications to meet the SOLAS demands.

EVC for full control in all situations

All engines are equipped with EVC-C, the latest development in engine control and instrumentation for Volvo Penta marine engines, for easy installation and easy handling.

A propulsion package fully matched, tested and supported by one company

The engines and the drives are developed and produced by Volvo Penta, and the service of the engines will be well taken care of by more than 5,000 Volvo Penta commercial and leisure dealers around the world.

Meeting new emission standards

The common rail injection system in combination with electronics and an advanced combustion system are setting new standards in minimizing noxious emissions and particulates. The engines comply with IMO NOx limits and the comprehensive emission requirements EU RCD and US EPA Tier 2 rating 5 Marine Leisure, rating 4 Marine Commercial).

Certificate

The engines will be delivered with a certificate and marked with a wheelmark in accordance with the MED/SOLAS regulations.

VOLVO PENTA

D4/D6 SOLAS

Technical description

For full technical information and performance data for the D4 and D6 engines, please see the product bulletins and technical data sheets for the selected power setting and model of D4 and D6 engine family.

Technical Data

Crankshaft power + dry weight BT inboard

D4-180:
@ 2800 rpm, kW (hp) 132 (180)
kg (lb)..... 482 (1063)
D4-225:
@ 3500, kW (hp) 165 (225)
kg (lb)..... 482 (1063)
D4-260:
@ 3500 rpm, kW (hp) 191 (260)
kg (lb)..... 482 (1063)
D6-280:
@ 3500 rpm, kW (hp) 206 (280)
kg (lb)..... 580 (1279)
D6-310:
@ 3500 rpm, kW (hp) 228 (310)
kg (lb)..... 580 (1279)
D6-330:
@ 3500 rpm, kW (hp) 243 (330)
kg (lb)..... 580 (1279)
D6-370:
@ 3500 rpm, kW (hp) 272 (370)
kg (lb)..... 580 (1279)

Battery

Minimum requirements for cold start:
- 12V, 1150 CCA for D4 engines
- 12V , 2300 CCA for D6 engines

Cold starting device

2 kW engine coolant heater to be installed for coldstarts below -15°C (down to -30°C)

Reverse gear

- Reverse gear with matched drop center and 8° down angle for compact installation and minimum propeller shaft angle.
- Bevel gears which results in smooth running at all speeds
- Hydraulically operated clutch for smooth shifting
- Electrical shifting performed by electro-magnetic valves
- Seawater-cooled oilcooler

Waterjet

- For selection of waterjet please contact your waterjet dealer.

Sterndrive DPH/DPR

- Complete with transom shield, and installation components
- Max tilt angle 50° (adjustable)
- Protective zinc anodes to prevent corrosion
- Built-in kick-up function to reduce possible damage, in the event the drive strikes an underwater object
- Electrical shifting performed by electronic actuator
- Power Trim with one-button operation in twin installation
- Fully integrated water inlet and exhaust system
- Fully hydraulic power-assisted steering system
- Isolated propellers to prevent corrosion

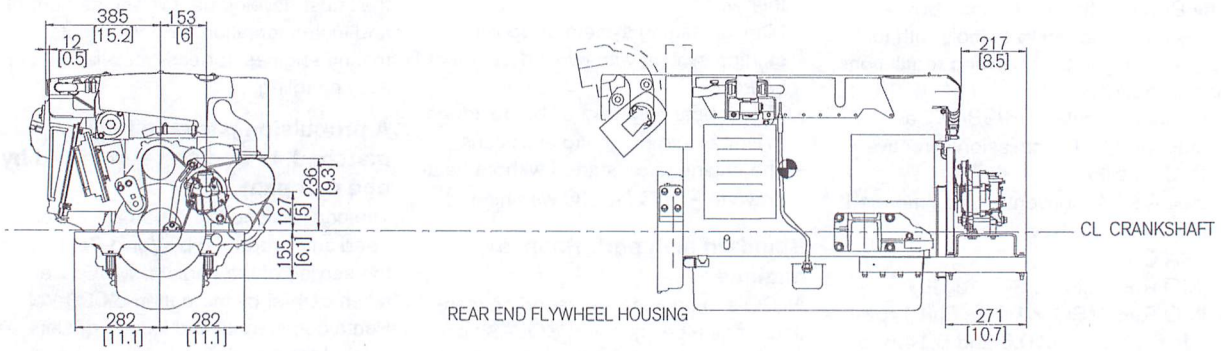
Contact your local Volvo Penta dealer for further information.

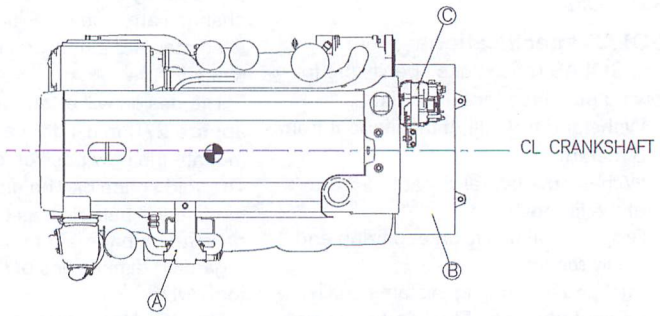
Not all models, standard equipment and accessories are available in all countries. All specifications are subject to change without notice.

The engine illustrated may not be entirely identical to production standard engines.

Dimensions

Dimensions shown are additional dimensions for SOLAS kit on D4 and D6. Not for installation.
For more dimensions, please refer to the respective product bulletin and installation drawing.





Ⓐ CRANKCASE VENTILATION
Ⓑ UNIVERSAL BRACKET
Ⓒ NEW PLACEMENT FOR ALTERNATOR

VOLVO PENTA

AB Volvo Penta
SE-405 08 Göteborg, Sweden
www.volvopenta.com

PRE SURVEY NOTIFICATION FOR GEOPHYSICAL SURVEY - Dive Shops

Elfers, Timothy <telfers@usgs.gov>

Fri 6/15/2018 1:30 PM

To: cmcdiver@aol.com <cmcdiver@aol.com>; info@santabarbarascuba.com <info@santabarbarascuba.com>; jeff@pacificwilderness.com <jeff@pacificwilderness.com>; dive@scubadivela.com <dive@scubadivela.com>; sealandingdivecenter@msn.com <sealandingdivecenter@msn.com>; blueh2o@west.net <blueh2o@west.net>;

Cc: Keen, Kelly@SLC <Kelly.Keen@slc.ca.gov>; Greenwood, Richard@SLC <Richard.Greenwood@slc.ca.gov>;

1 attachments (862 KB)

CSLC EXHIBIT F - USGS Santa Barbara Chip Jul2018_JTF_02.pdf;

PRE SURVEY NOTIFICATION FOR GEOPHYSICAL SURVEY

The USGS Pacific Coastal and Marine Science Center (PCMSC) will be conducting a geophysical survey in the Santa Barbara Channel under California State Lands Permit #8394. Operations will include a sub-bottom profiler and sparker sound source towed by the USGS research vessel Parke Snavely, a 36-foot aluminum catamaran. The survey will be conducted from July 9 – July 17, 2018.

In keeping with our California State Lands Permit requirements, we are providing you with the attached Geophysical Pre-Survey Notice for your information.

--
Tim Elfers

Marine Operations Manager
U.S. Geological Survey
Pacific Coastal Marine Science Center

Marine Facility
2831 Mission St
Santa Cruz, CA 95060

831-460-7479 office
831-332-9665 cell
831-421-9209 fax

PRE SURVEY NOTIFICATION FOR GEOPHYSICAL SURVEY - Harbor Masters

Elfers, Timothy <telfers@usgs.gov>

Fri 6/15/2018 1:32 PM

To: CIHarborVisitors@ventura.org <CIHarborVisitors@ventura.org>; mkronman@santabarbaraca.gov <mkronman@santabarbaraca.gov>; ktreiberg@santabarbaraca.gov <ktreiberg@santabarbaraca.gov>;

Cc: Keen, Kelly@SLC <Kelly.Keen@slc.ca.gov>; Greenwood, Richard@SLC <Richard.Greenwood@slc.ca.gov>;

1 attachments (862 KB)

CSLC EXHIBIT F - USGS Santa Barbara Chirp.pdf;

PRE SURVEY NOTIFICATION FOR GEOPHYSICAL SURVEY

The USGS Pacific Coastal and Marine Science Center (PCMSC) will be conducting a geophysical survey in the Santa Barbara Channel under California State Lands Permit #8394. Operations will include a sub-bottom profiler towed by the USGS research vessel Parke Snavely, a 36-foot aluminum catamaran. The survey will be conducted from July 9 – July 17, 2018.

In keeping with our California State Lands Permit requirements, we are providing you with the attached Geophysical Pre-Survey Notice for your information.

--
Tim Elfers

Marine Operations Manager
U.S. Geological Survey
Pacific Coastal Marine Science Center

Marine Facility
2831 Mission St
Santa Cruz, CA 95060

831-460-7479 office
831-332-9665 cell
831-421-9209 fax

PRE SURVEY NOTIFICATION FOR GEOPHYSICAL SURVEY - Geophysical Coordinator

Elfers, Timothy <telfers@usgs.gov>

Fri 6/15/2018 1:32 PM

To: SLCOGPP@SLC <slc.ogpp@slc.ca.gov>; D11LNM@uscg.mil <D11LNM@uscg.mil>; andrew.w.phelan@uscg.mil <andrew.w.phelan@uscg.mil>; Keen, Kelly@SLC <Kelly.Keen@slc.ca.gov>; Greenwood, Richard@SLC <Richard.Greenwood@slc.ca.gov>;

1 attachments (862 KB)

CSLC EXHIBIT F - USGS Santa Barbara Chirp.pdf;

PRE SURVEY NOTIFICATION FOR GEOPHYSICAL SURVEY

The USGS Pacific Coastal and Marine Science Center (PCMSC) will be conducting a geophysical survey in the Santa Barbara Channel under California State Lands Permit #8394. Operations will include a sub-bottom profiler and sparker sound source towed by the USGS research vessel Parke Snavely, a 36-foot aluminum catamaran. The survey will be conducted from July 9 – July 17, 2018.

In keeping with our California State Lands Permit requirements, we are providing you with the attached Geophysical Pre-Survey Notice for your information.

--
Tim Elfers

Marine Operations Manager
U.S. Geological Survey
Pacific Coastal Marine Science Center

Marine Facility
2831 Mission St
Santa Cruz, CA 95060

831-460-7479 office
831-332-9665 cell
831-421-9209 fax